

Patent Claims

1. Sputter arrangement with a magnetron and a target, in which magnetron and target can be moved relative to one another and the magnetron comprises a magnet system with at least one inner magnet and at least one outer magnet surrounding it, and in which the magnet system forms at least one closed plasma tube between an inner and an outer magnet, which includes two regions at a distance C from one another, which extend substantially perpendicularly to the direction of movement of the magnetron relative to a substrate and which have a diameter d , **characterized in that** with a relative movement between target (2) and magnet system (1) by a path $W \approx C$ the magnet system (1) is laid out such that the widths B of the ends of the plasma tube (9) fulfill the condition $B \leq d$.
2. Sputter arrangement with a magnetron and a target, in which magnetron and target can be moved relative to one another and the magnetron comprises a magnet system with at least one inner magnet and at least one outer magnet surrounding it, and in which the magnet system forms at least one closed plasma tube between an inner and an outer magnet, which includes two regions at a distance C from one another, which extend substantially perpendicularly to the direction of movement of the magnetron relative to a substrate and which have a diameter d , **characterized in that** with a relative movement between target (2) and magnet system (1) by a path $W > C$ the magnet system (1) is laid out such that the widths B of the ends of plasma tube (9) fulfill the condition $B \leq 2d$.
3. Sputter arrangement as claimed in claims 1 or 2, **characterized in that** the distance C between the two regions (16, 17) of the plasma tube (9) is defined by the distance of two positions on the surface of the target (2) in the direction of the relative movement, at which the component of the magnetic field vector

perpendicular to the surface of the target (2) is zero.

4. Sputter arrangement as claimed in claims 1 or 2, **characterized in that** the diameter d of the plasma tube (9) is defined by the distance of two positions on the surface and in the center of the longitudinal direction of the target (2) in the direction of the relative movement, at which the field vector forms with the surface of the target (2) an angle of approximately 20°.
5. Sputter arrangement as claimed in claims 1 or 2, **characterized in that** the width B of the ends of the plasma tube (9) corresponds to the maximum distance of the positions on the surface of the target (2) in the direction of the relative movement, at which the magnetic field vector forms an angle of approximately 20° with the surface of the target (2).
6. Sputter arrangement as claimed in claims 1 or 2, **characterized in that** the relative movement is a back and forth movement.
7. Sputter arrangement as claimed in claims 1 or 2, **characterized in that** the outer magnet (25) comprises two long parallel bar magnets (32, 33), whose ends are terminated by two small bar magnets (34, 35; 36, 37) forming a roof.
8. Sputter arrangement as claimed in claim 7, **characterized in that** the inner bar magnet has a smaller diameter (n, o) at its ends than at its center (m).
9. Sputter arrangement as claimed in claims 1 or 2, **characterized in that** three inner (61 to 63) and several outer magnets (64 to 75) are provided, and a region of a first

outer magnet (67) forms simultaneously a region of a second outer magnet and a region of the second outer magnet (66) forms simultaneously a region of a third outer magnet.

10. Sputter arrangement as claimed in claim 9, **characterized in that** the first and the third outer magnet comprise in each instance two bar magnets (64, 66; 65, 67) disposed parallel to one another, of which the one bar magnet (66, 67) is shorter than the other (64, 65), and that the ends of the two bar magnets are connected with one another by an L-form magnet configuration (70, 91; 73, 79 or 68, 74; 71, 76) each.